ARMY GROUND RISK-MANAGEMENT INFORMATION

Countermeasure

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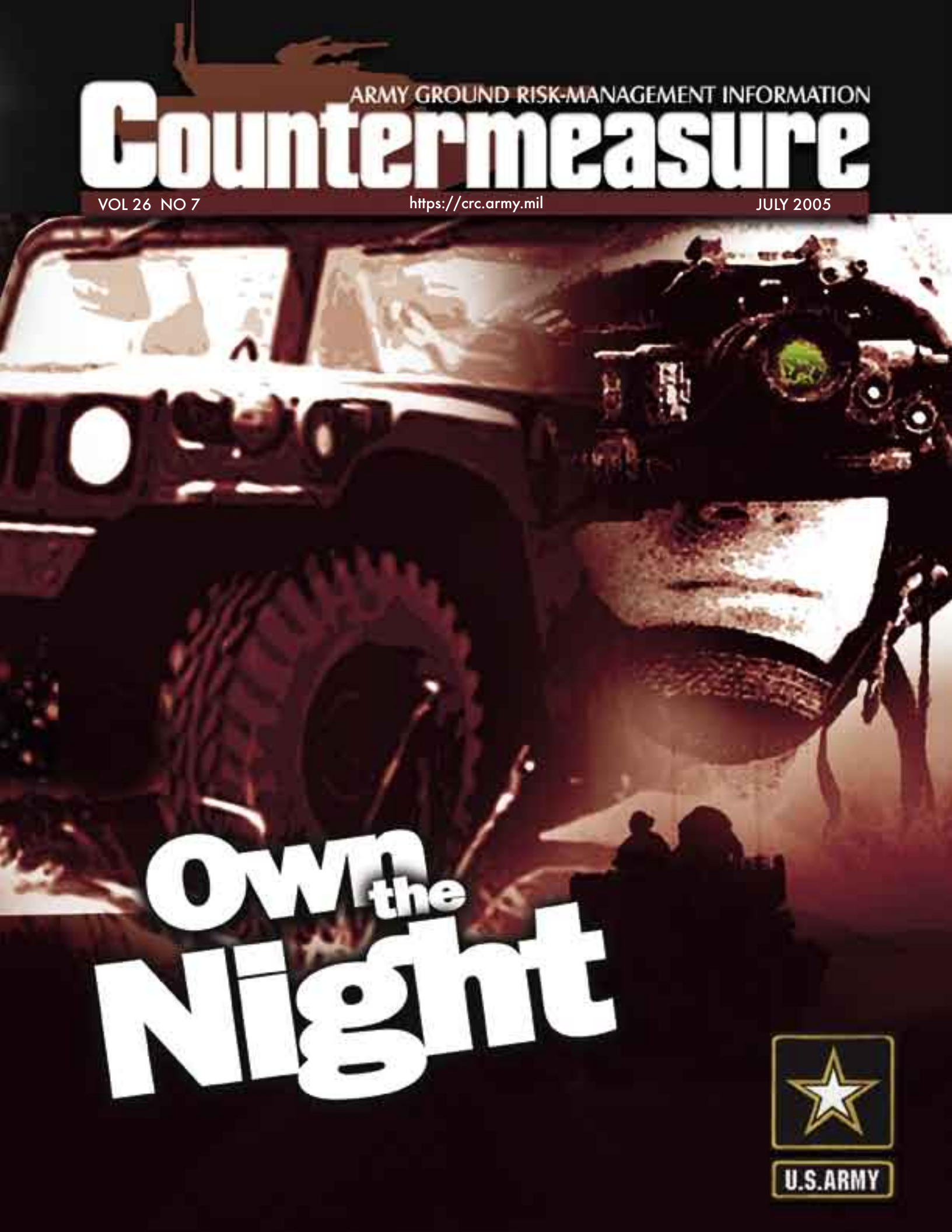


Own the Night

U.S.ARMY

DASAF'S CORNER

From the Director of Army Safety

Why the CRC and What's Next?

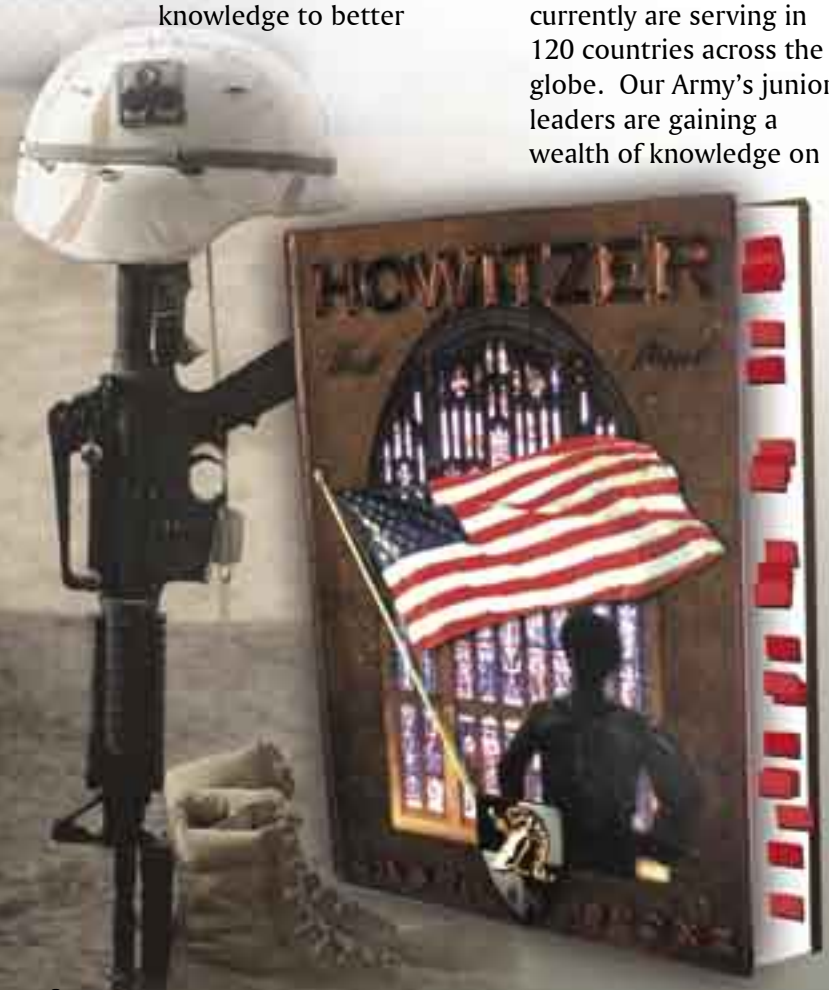
The Army Safety Center recently transformed to the Combat Readiness Center (CRC). Once an organization that focused solely on accidental losses, we're now looking at all losses of combat power. This holistic view is quickly providing a new capability for our Army to understand loss and become more effective through control measures and predictive analysis. So, what's next for the CRC? How will the Army operationalize this new knowledge to better support the combatant?

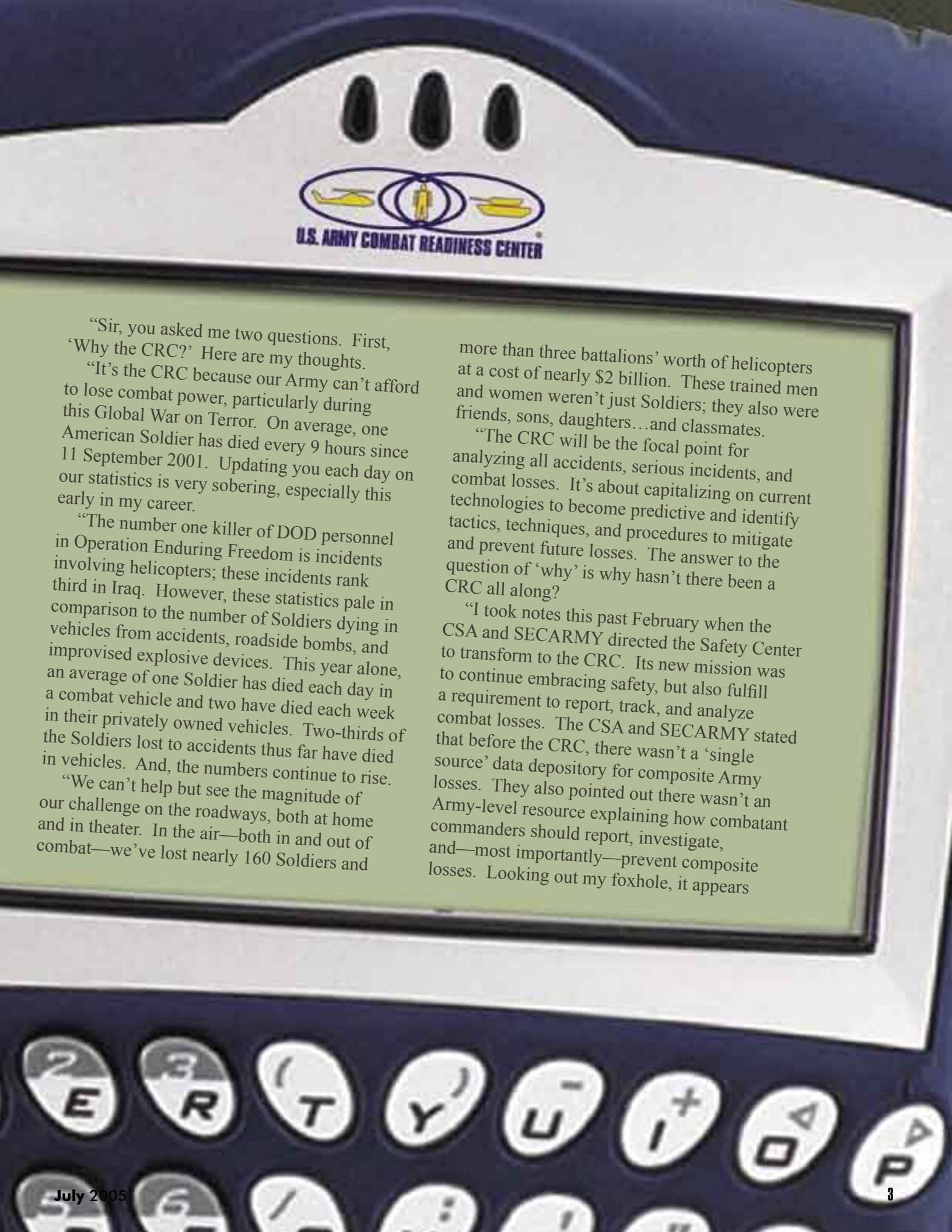
Guidance from the Chief of Staff, Army (CSA) and Secretary of the Army (SECARMY) is clear. In their words, we must "manage risk where the rubber meets the road, not be risk averse, and aggressively take the fight to the enemy by better understanding the risk and the required control measures." However, we can't meet this requirement unless the knowledge is relevant and in the hands of the user.

More than 300,000 American Soldiers currently are serving in 120 countries across the globe. Our Army's junior leaders are gaining a wealth of knowledge on combat operations, both on the ground and in the air. They've got a lot to say, and it's important that senior leadership listen as we move forward in our transformation. This point became clear to me as I was preparing my thoughts for this article and dialoging with my aide-de-camp.

My aide is a combat veteran, like many of our young leaders. In his brief career he's served tours in Korea, Afghanistan, and Iraq. I've dragged him around the world with me; he's participated in more than 120 briefings and been closely involved in countless Army-level investigations. So I asked him, "Why the CRC and not the Safety Center?" He quickly responded, "Sir, just last night I placed the twenty-third red tab in my West Point yearbook. Each red tab marks a peer of mine that's died... we need the CRC."

Losing friends is personal. His response was moving, so I decided to dig a little deeper and asked, "From your foxhole, what should be next for the CRC?" Early the next morning I found the following e-mail on my BlackBerry:





"Sir, you asked me two questions. First, 'Why the CRC?' Here are my thoughts.

"It's the CRC because our Army can't afford to lose combat power, particularly during this Global War on Terror. On average, one American Soldier has died every 9 hours since 11 September 2001. Updating you each day on our statistics is very sobering, especially this early in my career.

"The number one killer of DOD personnel in Operation Enduring Freedom is incidents involving helicopters; these incidents rank third in Iraq. However, these statistics pale in comparison to the number of Soldiers dying in vehicles from accidents, roadside bombs, and improvised explosive devices. This year alone, an average of one Soldier has died each day in a combat vehicle and two have died each week in their privately owned vehicles. Two-thirds of the Soldiers lost to accidents thus far have died in vehicles. And, the numbers continue to rise.

"We can't help but see the magnitude of our challenge on the roadways, both at home and in theater. In the air—both in and out of combat—we've lost nearly 160 Soldiers and more than three battalions' worth of helicopters at a cost of nearly $2 billion. These trained men and women weren't just Soldiers; they also were friends, sons, daughters…and classmates.

"The CRC will be the focal point for analyzing all accidents, serious incidents, and combat losses. It's about capitalizing on current technologies to become predictive and identify tactics, techniques, and procedures to mitigate and prevent future losses. The answer to the question of 'why' is why hasn't there been a CRC all along?

"I took notes this past February when the CSA and SECARMY directed the Safety Center to transform to the CRC. Its new mission was to continue embracing safety, but also fulfill a requirement to report, track, and analyze combat losses. The CSA and SECARMY stated that before the CRC, there wasn't a 'single source' data depository for composite Army losses. They also pointed out there wasn't an Army-level resource explaining how combatant commanders should report, investigate, and—most importantly—prevent composite losses. Looking out my foxhole, it appears

there's very little Composite Loss Awareness (CLA) shared across the battlefield.

"Your second question was, 'What's next for the CRC?' Clearly, we must enhance CLA where the rubber meets the road. From my perspective, CLA is defined best as providing and sharing holistic loss data so Soldiers can understand each mission's unique characteristics, similarities, and relevance to previous incidents. For nearly 2 years, senior leaders knew seatbelts weren't being worn in vehicles; aircraft were flying too low and too fast in certain conditions; and hazards often were overlooked in anticipation of enemy engagement. Regardless of the number of policy letters written, every unit relief in place or transfer of authority resulted in learning the lessons anew. How do we become more aware and not repeat our mistakes? How can the CRC provide CLA?

"CLA works only if everyone in the formation understands what can take them out of the fight, regardless of the cause. This understanding exists in the tactical and non-tactical environment when Soldiers know and manage the risks. Composite Risk Management (CRM) insists that all players know the dangers, understand the trends, and comprehend the particular environment in which they operate, combat or not.

Therefore, acquiring CLA is essential to managing composite risk. Leaders then can make the right decisions rapidly and without lengthy, calculated, and metric-based computations ('old safety'). Digital warriors already are familiar with the concept of CLA, and the CRC will enable them in combat. Here's how.

"There's a grid coordinate location associated with every incident report the Army sends and receives, whether the report is generated through the in-theater SIGACTS, ArmyWatch, Joint IED Task Force, Army Shootdown Assessment Team (ASDAT), serious incident reports, or CRC accident reports. The intelligence community has known for many years the value of populating a map with enemy movement and reports. Why hasn't the safety community grasped this same concept? Safety isn't operationalized by doctrine and, therefore, often isn't seen as a composite part of the fight.

"Imagine the Force Battle Command, Brigade-and-Below (FBCB2) or BlueForce Tracker (BFT) overlay on the M1114 HMMWV. These screens look a lot like the interactive moving maps displayed on any navigation system in a newer-model car. The route is planned, the briefings are conducted, and the patrol begins. Using these existing systems, the CRC should live up to its potential and provide our Soldiers with relevant, interactive, and worthwhile information. This same concept applies to the young aviator planning his mission on the Aviation Mission Planning System (AMPS) and op cell monitoring on BFT. The maps generated by these current Army systems should include an overlay of composite loss data.

"Since the CRC will maintain a centralized loss database, it has the capability to plot on these maps a color-coded dot (orange) for every accident occurring in Iraq since the first movement. Additionally, the CRC should receive real-time reports from the IED Task Force and ASDAT or SIGACTS. Those incidents can be plotted easily with another color (red) to indicate enemy activity. Interactively overlaying this information with two basic choices—length of time

(30, 60, or 90 days or 6 or 12 months) and the type of loss (air or ground)—will justify its relevance to the user.

"When a cursor drops over any particular dot, the specifics of the incident will display in a small pop-up window (e.g., 'M1114 Rollover/Speed' or 'OH-58D Shootdown/SA16'). If the user wants more information, a simple double-click immediately will link him to the loss or accident report for that particular incident. The tool's value is that it will remain a single-entry requirement from current databases across the Army. Multiple venues and users will engage simultaneously on the SIPRNET as a software program from current technologies (AMPS and BFT).

"If these maps were printed and posted at every ALOC convoy sign-out location, in the commander's office, or beside every flight operations hazard map, the Army's junior leaders could visualize the importance of not speeding, wearing seatbelts, and rehearsing rollover drills. A majority of orange dots undoubtedly would convince a young convoy commander. For aviators, these orange dots sometimes would justify altitude restrictions, airspeed, or airspace constraints, which often are overlooked.

"What if this information was interactive and with the user at all times? Step back into that M1114 HMMWV and sit at the BFT screen. Along the route, imagine the TC or company commander is scrolling the menus and happens to see on his 10-meter imagery a series of orange or red dots 5 miles ahead. A closer look reveals this road historically has more IED attacks than accidents, or that the orange dots are rollovers caused by excessive speed in oversized vehicles. In seconds he can pick up the radio and tell the other vehicles to reduce their speed for the next 2 miles. Single entry, multiple use, and relevant to the combatant—a real-time, interactive CLA overlay providing the necessary situational awareness and rapid risk mitigating decision skills necessary to cut all types of Army losses.

"One step further would allow unit adaptation. The CRC manages the minimal Army data and map-populated points. However, the software allows catered modifications for any deployed unit that wishes to annotate additional near-miss information or collect close-call data (missed enemy engagements or near mid-air collisions). The CRC will work closely with the software and rapidly modify it to fit the unit's request.

"**We've lost the equivalent of three brigades since 9/11, and nearly half these losses weren't in combat.** For often unforgiving and preventable reasons, many superb Army leaders are no longer in the fight. We're the best Army in the world and we can do better—our Nation deserves it. Understanding and learning from composite losses is the fastest way our combatant commanders can make the appropriate decisions to prevent the loss of combat power. CLA through digital technology will save lives and enable CRM—it's the way ahead for the CRC and the key to helping our combatant leaders.

"Very Respectfully,
Travis"

So, why the CRC and what's next? Hmm…I couldn't have said it better myself! ★

Joe Smith

BG Joe Smith

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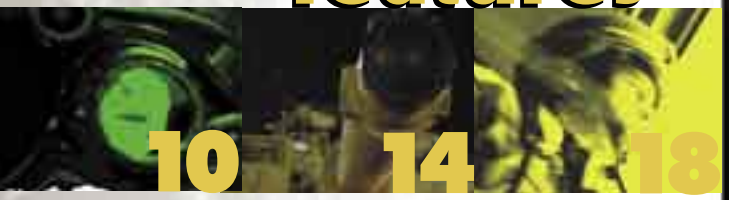

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U.S. ARMY COMBAT READINESS CENTER

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Our Soldiers are serving in all corners of the globe. Their missions and living conditions vary, but their locations all have one thing in common—it gets dark sometime. When night falls, even the most mundane tasks become a lot harder, and this is especially true of driving. In Iraq, blowing dust and sand often make driving during the day a challenge; darkness only intensifies already poor conditions. In fact, most OIF veterans will tell you night in Iraq is a whole lot darker than night at home.

Our missions must go on, however, no matter the conditions. As such, Soldiers must take driving at night seriously. Since the beginning of Fiscal Year 2005, the Army has lost 22 Soldiers in nighttime vehicle accidents. The loss of these Soldiers has led to many dark days for their buddies, their units, and their families. The paragraphs below highlight each of these accidents and include the time of occurrence. It's worth noting that more than

Days

JULIE SHELLEY
Editor

half these accidents occurred between 1900 and 2000 hours, and almost all occurred in Iraq.

• **HMMWV collision, 1850 hours, Iraq:** M1114 and M998 collided. The M998 driver was ejected from the vehicle and suffered fatal injuries. He was not wearing his Kevlar helmet or seatbelt.

• **HMMWV rollover, 1916 hours, U.S.:** M1025 rolled over during a convoy movement. The driver was speeding and made an abrupt turn to avoid two barricades in the roadway, causing the HMMWV to overturn. One Soldier was killed, and the driver and two other Soldiers suffered minor injuries. None of the Soldiers were wearing seatbelts.

• **BFV rollover, 1950 hours, Iraq:** An M2 rolled over into a canal after the roadway collapsed beneath the vehicle. Five Soldiers drowned initially; one other Soldier died after he was hospitalized.

• **ASV collision, 1951 hours, Iraq:** M1117 Armored Security Vehicle hit a civilian automobile head-on. The civilian driver reportedly lost control of the vehicle and was killed in the accident. One Soldier suffered minor injuries.

• **HMMWV collision, 1945 hours, Iraq:** M1114 collided with a civilian vehicle during a mounted patrol in black-out drive. The civilian driver was killed. The M1114 driver and two other Soldiers were injured.

• **HEMTT rollover, 2000 hours, Iraq:** M984 overturned during a convoy movement when the driver experienced difficulty with the brakes. The gunner was ejected and suffered fatal injuries.

• **HMMWV rollover, 2000 hours, Iraq:** M1114 rolled over into a drainage ditch after the driver steered the vehicle too close to the road's edge while making an improper turn. The HMMWV landed upside down 5 feet of water. The driver and one other Soldier drowned.

• **HMMWV rollover, 2002 hours, Iraq:** M1114 rolled over when the driver lost control after attempting to pass a slower convoy. The vehicle crossed the median before it overturned. The gunner was killed.

• **HMMWV rollover, 2045 hours, Afghanistan:** M1037 rolled over while the driver was negotiating a 4-foot wadi during a combat patrol. The gunner was killed. The vehicle occupants, including the gunner, were wearing seatbelts.

• **HMMWV rollover, 2246 hours, Iraq:** M1114 hit a barrier and overturned during a convoy movement. The gunner suffered fatal injuries.

• **HEMTT rollover, 2248 hours, Iraq:** M1075 struck a barrier and rolled over after the driver lost control of the vehicle. The truck commander was killed.

• **HMMWV rollover, 0005 hours, Iraq:** M998 overturned down a 20-foot aqueduct spillway when the driver made an improper right turn. One Soldier was killed, and eight other Soldiers suffered minor to serious injuries.

• **HMMWV rollover, 0105 hours, Iraq:** M1114 overturned during black-out drive for unknown reasons. The vehicle occupants were ejected when one of the doors separated during the rollover. One passenger was killed.

• **BFV rollover, 0350 hours, Iraq:** M2A2 rolled over into a canal while on a combat patrol. The vehicle's white lights were on at the time of the accident. The track commander suffered fatal injuries.

• **HMMWV collision, 0435 hours, Iraq:** M1025 crashed into the back of an M1A1 parked on a bridge. The tank's infrared flashers were activated at the time of the accident. The M1025 truck commander suffered fatal injuries.

• **HMMWV rollover, 0512 hours, Iraq:** M1114 ran off the roadway and rolled over into a canal during a patrol convoy. All three vehicle occupants drowned.

Most of these accidents can be attributed to operator error. No Soldier should be afraid of the dark, but carelessness or a simple misjudgment that leads to tragedy is something to fear. Fight at night, survive, and keep the days ahead bright.

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Night VISION Not Just For SUPERM

OPERATIONS DIVISION
U.S. Army Combat Readiness Center

Today's battlefield is drastically different from the large-scale conflicts seen in the early to mid-20th Century. The enemy in Iraq and Afghanistan is a scattered force that lurks in the shadows and fights by indirect means. Effectively fighting and maneuvering at night is essential to winning our Nation's wars in the face of this elusive enemy.

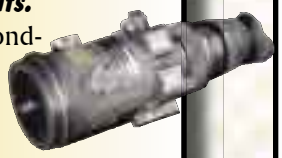
You don't have to be Superman to see and fight at night. Kryptonite might not be available through your local supply chain, but night vision devices (NVDs) are. For several decades, Soldiers have been using NVDs to see, maneuver, and shoot at night or during periods of reduced visibility. The Army currently issues several variants of two different NVD types: image intensifying devices and thermal forward-looking infrared (FLIR) devices.

Image intensifying devices amplify available light, and there must be some light present for them to work. These devices intensify available light by 2,000X to 5,000X. Most image intensifying devices are classified as night vision goggles (NVGs). ***Current NVG systems include:***

AN/PVS-14 Monocular Night Vision Device (MNVD). Combat infantry leaders use this small, lightweight device for observation and command and control. It interfaces with the AN/PVS-7D head and helmet mounts and the 3X magnifier. The MNVD also can be mounted on small arms weapons with a rail grabber.

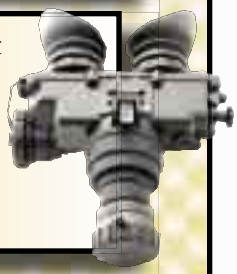
AN/VVS-2 Driver's Night Vision Viewer. The AN/VVS-2 is a night vision scope that provides closed-hatch night vision capability in combat vehicles. Its second-generation image intensifier tube is an improvement over unaided night vision, but is inferior to any third-generation intensifier.

AN/PVS-4 and AN/TVS-5 Weapon Sights. Both these systems are lightweight, second- or third-generation scopes and can be mounted on a variety of weapons or handheld for surveillance purposes.



AN/PVS-5. The AN/PVS-5 is one of the original NVG systems developed for individual use. This system uses a second-generation image intensifier tube for combat, combat support, and combat service support operations.

AN/PVS-7D. This system is a lightweight goggle that uses a single third-generation image intensifier tube. Its performance is significantly better than the AN/PVS-5. Its uses include combat, combat support, and combat service support operations.



AN/PVS-10 Sniper Night Sight (SNS). The AN/PVS-10 SNS is an integrated day and night sight for the M24 sniper rifle. With this system, snipers can acquire and engage targets during low or high ambient light conditions. The AN/PVS-10 SNS, which mounts on the M24, uses the same mil-dot reticle as the existing Leopold day scope and provides 8.5X magnification.

Thermal FLIR detectors (sometimes called "sensors") detect the temperature difference between an object and the surrounding environment. FLIR systems are installed on certain combat vehicles and helicopters. These systems include:

AN/VAS-5 Driver's Vision Enhancer (DVE). Combat and tactical wheeled vehicle drivers use the DVE during day or night operations when their vision is degraded by smoke, fog, dust, or similar conditions.

AN/PAS-13 Thermal Weapon Sight (TWS). Soldiers can see deep into the battlefield with the AN/PAS-13, which increases surveillance and target acquisition ranges and allows obscurant penetration during day or night. The second-generation TWS is a major improvement over the image-intensifier night sights currently used on small arms.

The systems described above represent advances in technology that wouldn't have been possible even 50 years ago. The Army's given you the best equipment available to fight at night and survive. Use your "superpowers" and make it home!

Comments regarding this article may be directed to the editor at (334) 255-1218, DSN 558-1218, or by e-mail at julie.shelley@safetycenter.army.mil.

AFRAID OF THE DARK

All too often, what you can't see can kill you. This is especially true when you're driving across unfamiliar terrain at night. Although night vision goggles (NVGs) are a great improvement over the unaided eye, they don't come close to actual daylight. You can't let your guard down at night, even for a second! Some of the limitations associated with NVG use are listed on the next page, so take note before you head out on your next night mission.

OPERATIONS DIVISION
U.S. Army Combat Readiness Center

Reduced field of view (FOV) and scanning

Looking through NVGs is a lot like peering down a tunnel. Your normal FOV is almost 190 degrees, but with NVGs your FOV is only 40 degrees. This is because your peripheral, or side, vision just isn't there with NVGs. To compensate, you must turn your head constantly to scan for hazards.

You can get into trouble very quickly if you don't scan, or if you scan but don't do so properly. This lesson has been learned the hard way far too many times.

Several years ago the U.S. Army Aeromedical Research Laboratory studied scanning in Army Aviation and developed a recommended strategy for aircrews on NVG missions. Many of their recommendations also work well during ground operations.

Here are a few:

- Formal scan or search patterns aren't necessary. After relatively little training, search performance is better with "free" viewing.
- Adjust your vehicle's speed to fit your location. Typically, the faster you drive, the slower you tend to scan. This is because your eyes take longer to identify fine details at higher speeds. As such, reduce your speed when driving in congested areas or on rough terrain and in limited-visibility conditions.
- Your first priority when scanning is to identify hazards. Identify objects as far away as possible and monitor them until your vehicle is clear. However, to prevent fixation, don't look at any object for more than a second or two.
- The best resolution is in the tube's center, so don't practice off-center viewing under NVGs.
- Don't turn your head too quickly while scanning. Sudden movement can lead to disorientation. Remember that scanning naturally slows down or even stops altogether when you're tired and during emergencies or stressful situations.
- NVG missions are a team effort. All NVG users must help their drivers identify any hazards, especially those on the road's right shoulder.

Reduced visual acuity (sharpness)

NVGs don't provide the same level of sharpness you're accustomed to in daylight. Normal vision is 20/20, but your vision through NVGs is only about 20/25 to 20/40 in *optimal* conditions. Your visual acuity drops as illumination or contrast decreases, giving you an even "fuzzier" image.

Reduced depth and distance perception

Normally you use both eyes (binocular vision) to estimate an object's distance and depth. With NVGs you're essentially using only one eye (monocular vision), which poses real problems. For example, imagine two different-size objects sitting side by side. Under NVGs, the larger object will appear nearer. Similarly, the object in front of a series of overlapping targets appears nearer (possibly much more so than true) through NVGs. Some objects also might appear farther away than they actually are.

We tend to associate the loss of detail sharpness with distance. However, a light source that's not part of a terrain feature—for example, a light atop a tower—might look closer than it really is. You must be aware of these potential problems and recognize that you'll overestimate distance and underestimate depth under NVGs.

Dark adaptation

Your eyes need time to adjust from day to night vision. When you first walk into a dark movie theater during the day, you can barely see because your eyes need time to adjust to the darkness. The same principle holds true with any night vision device (NVD). You're basically getting a dim-day view through NVDs, so when you remove them your eyes have to adapt to the darkness.

Adaptation time depends on how long you've been wearing the NVDs. Most people achieve about 75 percent dark adaptation within 30 seconds. This fact is especially important to remember if you're using NVDs as binoculars (basically lifting them to your eyes and then lowering them).

Accidents ranging from fender-benders to mission stoppers sometimes happen because people misinterpret what they see through their NVDs. To train safely and win on the battlefield, you must understand the limitations of your night vision equipment and be skilled in using it. Leaders also must be aware of the hazards involved in NVD operations and take measures to control the risks. Be safe and own the night!

Comments regarding this article may be directed to the editor at (334) 255-1218, DSN 558-1218, or by e-mail at julie.shelley@safetycenter.army.mil.

PITCH BLACK?

NO PROBLEM!

1LT MATTHEW NOWLIN
A Co., TF 1-151 AVN (ATK)
Balad, Iraq

It's overwhelmingly dark in Iraq. In the United States, we grow up under the orange glow of streetlights and neon fast-food signs. There's light in most places, even when it's dark. But it's so different over here, and it's difficult to describe to someone who's never experienced it personally. The darkness literally swallows every detail, and you can become disoriented in just a matter of seconds.

I'd adjusted—or so I thought—to the dark abyss that cloaked my forward operating base every night. We were forbidden from using white lights, lest we attract small arms or indirect fire from the enemy elements that always lurked outside. So, nearly everyone—me included—carried a small LED light to find our way around. My light had grown increasingly dim over several weeks, but I never replaced the battery. I'd developed this misguided confidence that I could find my way around, even through the maze of barriers and concertina wire.

One night I was working in the TOC and felt nature's call. No problem! I knew the path from the TOC to the latrine well and, since I'd been on duty for several hours, my eyes had

adjusted to the dark somewhat. With only a few stumbles along the way, I made it to the well-lit latrine and took off my helmet. I was in the latrine for just a couple of minutes, but my night vision deteriorated significantly—a fact I found out the hard way.

I paused for a second when I walked out of the latrine, helmet in hand. I was surprised at how much darker it looked outside. I started climbing down the stairs, still carrying my helmet by the chin strap. I was almost home-free when, at the bottom of the stairs, I tripped and fell head-first into a concrete bunker. I got up okay, but the sharp pain in my forehead and blood streaming down my face told me this injury wasn't pretty.

Several stitches later I was sitting in the aid station, nursing my wounded pride and wondering what I could've done to prevent this accident. Suddenly, a peace came over me. I realized I lacked balance in my life!

Achieving balance is the key to risk mitigation. I know you're thinking, "What does my inner 'tao' have to do with making the combat environment safer?" Simply put, the answer is everything!

With too many controls, missions become over-involved and ineffective. On the other hand, too few controls allow unnecessary dangers to creep into an already hazardous situation. Leaders must perform a thorough risk analysis during the mission-planning process to determine the mission's "tao."

Leaders must give consideration to the most common conditions their units might encounter. Some scenarios are difficult to predict, while others are too improbable to demand exhaustive planning. However, adding a few unlikely scenarios will help provide balance to most plans. Controls should address how to prevent a given scenario from occurring and, if it does occur, how to reduce its impact on the mission.

Looking back now, I should've analyzed my environment and developed controls to reduce the hazards waiting in the dark. I obviously couldn't use a spotlight because of the tactical hazards posed by white light. So, I accepted the accidental hazards and walked around totally unaided. If I'd simply replaced my battery—and put my helmet back on when I left the latrine—I'd have saved myself some pain and pride!

Contact the author by e-mail at matthew.nowlin@us.army.mil.

NVGs Don't Prevent Falls in the Dark!

A tracked vehicle parked in front of the aid station is never a good sign in a war zone. This Soldier emerged from the back of one such vehicle with a large, bloody dressing on his head. He was on patrol and wearing his NVGs when he tripped and fell forward on his face. The impact embedded the goggles in his left eyebrow and cut the flesh to the skull. Two layers of sutures, one deep and one surface layer, were required to close the wound. Watch your step—NVGs don't prevent falls in the dark!

—Photo and caption courtesy LTC Roman Bilynsky, Chief of Neurology Service, William Beaumont Army Medical Center, Fort Bliss, TX. The photo was taken in early 2004 while LTC Bilynsky served with the 4th Forward Support Battalion, 4th Infantry Division, in Tikrit, Iraq. He may be contacted by e-mail at roman.bilynsky@us.army.mil.

DID YOU KNOW?

Serious injuries don't always bleed heavily, and some relatively minor injuries (like the scalp wound the Soldier in this story suffered) can bleed profusely. When in doubt, see the doc!

Nig

SFC JOHN TEMPLE
Accident Investigator
U.S. Army Combat Readiness Center

It was a typical summer night at the Joint Readiness Training Center—hot and humid. A unit training there was conducting an exercise that simulated an assault on a town. The exercise included mounted and dismounted Soldiers. Shortly after the exercise began, the light infantry dismounted from a truck about a kilometer from the objective and linked up with some M1 tanks.

It was getting dark, so the tanks' drivers switched on their driver's night sights. The dismounted infantry took up positions near the tanks. About an hour later the company commander called one of the tanks forward. Although the tank was moving very slowly, the driver didn't notice the dismounted Soldiers lying in a ditch about 50 yards to his front. A few minutes later someone yelled, "Stop the tank! Stop the tank!" The driver didn't know what was wrong, but he stopped the tank anyway. He soon discovered that he'd run over and killed two dismounted Soldiers.

The driver hadn't attended night driver's training. He also didn't know his driver's night sight was deadlined because it couldn't be focused at 50 feet. He simply assumed that was the way the sight worked. Driving with any type of night vision devices (NVDs) is a challenge under the best of conditions, but especially with little or no training and deadlined equipment.

The driver of that tank made several fatal errors—mistakes made, however, because he hadn't been trained properly. A good driver's training program must focus on all

htMoves

aspects of driving, whether during the day, at night, or in between. These programs also must be tailored to the area of operations and include specifics of NVD use and maintenance.

Training with NVDs is a critical component of any driver's training program, but particularly important before deployment. Soldiers deployed to Iraq and Afghanistan are driving in some of the most demanding terrain ever encountered. One common problem is depth perception, which is diminished naturally with NVDs. However, brownout caused by blowing dust or other low-visibility conditions restrict depth perception even further.

One possible threat emerges when a highly skilled driver with in-theater experience leads inexperienced drivers in a night convoy. Since the new drivers' skills are inadequate, they often fall too far behind and lose sight of the lead vehicles. To compensate, the inexperienced Soldiers drive faster to make up the distance and maintain convoy discipline. This is a dangerous game.

The landscape in Afghanistan and Iraq is unforgiving, and the roads are often narrow and full of unforeseen hazards. Leaders must instruct Soldiers to dismount and ground-guide their vehicles in restricted areas and during periods of limited visibility. Commanders also must establish tactics, techniques, and procedures for stopping and transitioning from unaided driving to NVDs. In addition, leaders must brief the transition to NVDs on every mission.

Use Army Regulation 600-55 and Training Circulars 21-305 (wheeled vehicles) and 21-306 (tracked vehicles) to develop a driver's training program that's transportable to the theater of operations. Training must include provisions for Soldiers transitioning to driving positions and new Soldiers coming into the unit. Commanders must stay involved in licensing and driver selection, even in the area of operations.

Plan to conduct sustainment training that focuses on the changing environment (both terrain and weather) units will encounter in theater. Sustainment training must be conducted at least once a year. However, with the intensity of deployed operations and the potential for personnel movement, units should plan to conduct sustainment training more often as conditions permit. An effective driver's training program that includes driving at night and in other limited-visibility conditions will improve readiness and preserve combat power.

Editor's note: This article was written shortly before SFC Temple left the CRC for a position at Camp Shelby, MS. We'd like to thank SFC Temple for his many contributions to Countermeasure *during his time at the CRC. He may be contacted by e-mail at john.templejr@us.army.mil.*

DID YOU KNOW?

NVDs have been around more than 40 years and are categorized by generation. Each substantial change in NVD technology establishes a new generation. Generation 0 was the original night vision system developed by the Army and was used in World War II and the Korean War. Unfortunately, it didn't take long for hostile armies to duplicate Generation 0 NVDs. Enemy soldiers then used their own NVDs to locate American personnel.

A patrol is a mission. The unit that has the mission organizes the patrol. Unit integrity should be maintained as much as possible while organizing the patrol. For example, when a squad is tasked to conduct a patrol, the squad leader automatically becomes the patrol leader (Field Manual [FM] 7-7, chapter 7-1). The incident described below is one of many mounted combat patrol accidents that resulted in a HMMWV rollover.

The section leader of two M1114 up-armored HMMWVs established a nighttime observation post (OP) to watch over a main road in Iraq. The section's Soldiers frequently drove in the area and were very familiar with the roads and ditches along the various routes. The section leader placed the second HMMWV approximately 70 meters behind him so its crew could provide rear security.

The section leader spotted a suspicious vehicle and alerted the HMMWV behind him. The second HMMWV's driver prepared to follow the section leader's HMMWV, which had turned right onto a paved road. The driver, who was wearing AN-PVS/7 night optical devices (NODs), drove down the dirt road without the vehicle's lights on. His senior occupant wasn't wearing NODs and was busy adjusting his equipment and the radio instead of scanning outside the vehicle.

The second HMMWV's driver turned on the vehicle's lights and began to turn right as the HMMWV reached the paved road. He removed his NODs at the same time. Suddenly, the passenger-side tires missed the edge of the paved road, and the vehicle began to slide down toward the ditch. The HMMWV rolled over and landed upside down in 5 feet of very cold water. Two Soldiers—the driver and a passenger—drowned.

Patrol leaders must consider several factors before any mission. First, they must analyze the mission and decide what elements and teams are needed. Then, they must select personnel to fill the elements and teams, and also decide what weapons and equipment to provide. One mistake in the accident above was made by the NCO platoon leader. He allowed the accident vehicle's senior occupant and primary driver to go on leave at the same time. An alternate senior occupant and alternate driver took their place, although other primary drivers and senior occupants were available. Leaders must consider the hazards associated with crew assignments and ensure senior occupants know to scan for hazardous road conditions and correct their drivers when needed.

Patrol leaders also must determine the best technique to accomplish the mission (FM 7-7, chapter 7-39). They also should use their unit's normal organization and chain of command, including squad leaders and platoon sergeants, to man the patrol (FM 7-7, chapter 7-2). The elements, planning considerations, control measures, and techniques for mounted patrols are the same, regardless of whether the mission is for combat or reconnaissance.

Finally, commanders and leaders must conduct composite risk assessments and consider all the hazards associated with a

trolling Leadership

MSG MELVINE ALEXANDER
Accident Investigator
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given mission. Once the hazards have been identified, they must develop and implement appropriate control measures. In addition, the platoon leader, platoon and section sergeants, and senior occupant on any patrol mission must coordinate continuously throughout the planning and preparation phases. Some of the patrol leader's coordination is done by these other leaders. Therefore, the patrol leader should double-check all preparations to ensure nothing is overlooked.

Leadership is the key to mission success. When leaders set the example and do their jobs properly, Soldiers' lives are saved. There's not a more worthwhile job in the Army!

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The All-Seeing A

SFC BALDEMAR GONZALES
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Daytime Airborne operations are full of known and unknown risks. The fall of night, however, introduces a host of other potential problems. Good vision is vital to successful Airborne operations, particularly at night. When paratroopers seize an airfield in the wee hours of morning, they feel intense satisfaction. However, these type operations won't be successful without the watchful eyes of our Airborne Soldiers.

You haven't lived until you've stepped out of a "perfectly good aircraft" into total darkness with more than 100 pounds of equipment strapped to you. Hooah—when's the next jump?! Before you sail off into the deep blue yonder, let's review the five points of performance to demonstrate the importance of eyesight during Airborne operations.

First, a jumper must keep their eyes open and their chin on their chest so they can recognize and react to situations around them. Second, they must inspect the canopy and gain control of their chute. If the risers are twisted, the paratrooper then must compare their rate of descent to that of the other jumpers. Third, jumpers

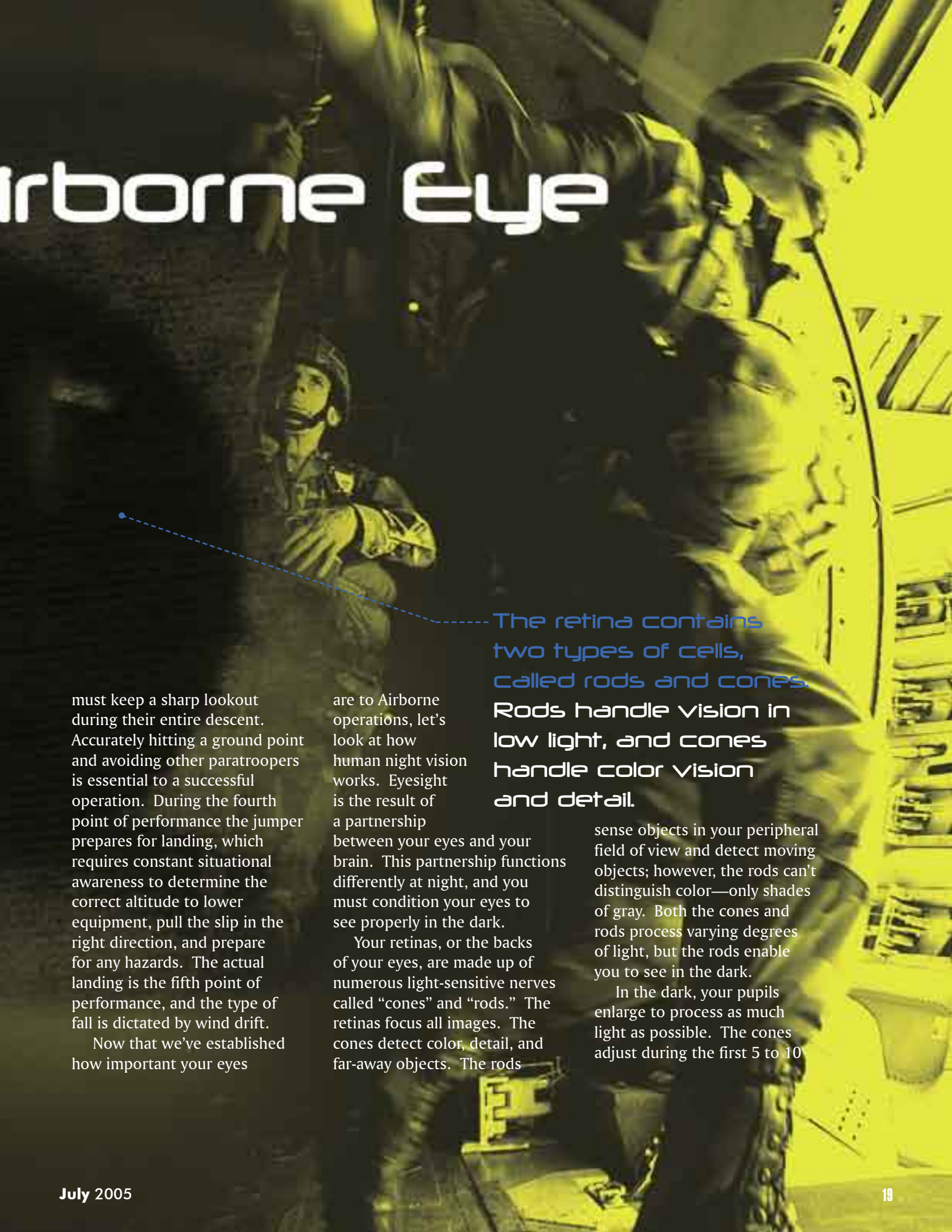
Brain Power

The brain combines the images that each eye sees into one picture.

Basic Anatomy

Although small in size, the eye is a very complex organ. The eye is approximately 1 inch (2.54 cm) wide, 1 inch deep, and 0.9 inches (2.3 cm) tall.

irborne Eye



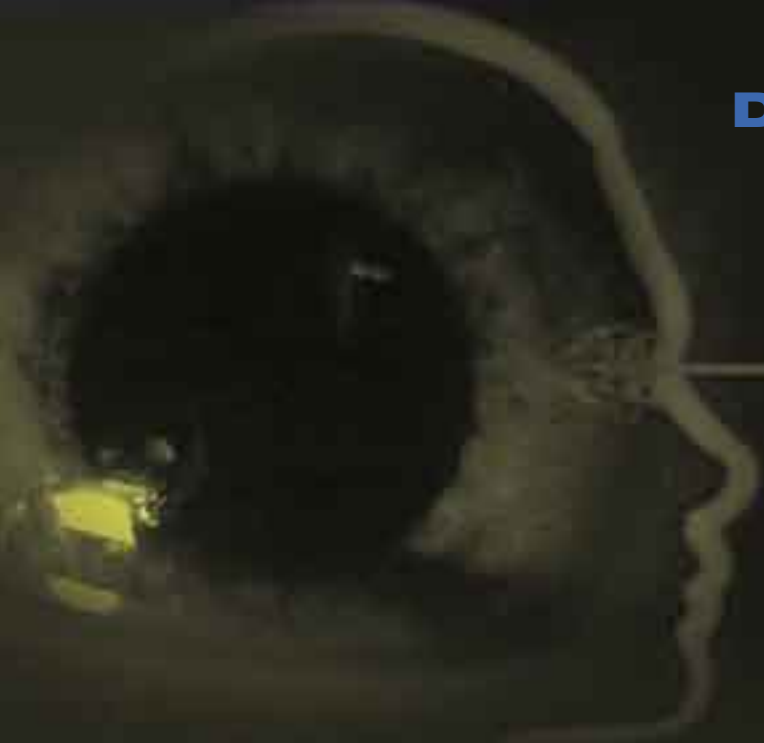
must keep a sharp lookout during their entire descent. Accurately hitting a ground point and avoiding other paratroopers is essential to a successful operation. During the fourth point of performance the jumper prepares for landing, which requires constant situational awareness to determine the correct altitude to lower equipment, pull the slip in the right direction, and prepare for any hazards. The actual landing is the fifth point of performance, and the type of fall is dictated by wind drift.

Now that we've established how important your eyes are to Airborne operations, let's look at how human night vision works. Eyesight is the result of a partnership between your eyes and your brain. This partnership functions differently at night, and you must condition your eyes to see properly in the dark.

Your retinas, or the backs of your eyes, are made up of numerous light-sensitive nerves called "cones" and "rods." The retinas focus all images. The cones detect color, detail, and far-away objects. The rods sense objects in your peripheral field of view and detect moving objects; however, the rods can't distinguish color—only shades of gray. Both the cones and rods process varying degrees of light, but the rods enable you to see in the dark.

In the dark, your pupils enlarge to process as much light as possible. The cones adjust during the first 5 to 10

The retina contains two types of cells, called rods and cones. Rods handle vision in low light, and cones handle color vision and detail.



DID YOU KNOW?

Night blindness occurs when severe vitamin A deficiency is present. Vitamin A is necessary to form retinal, which is part of the rhodopsin molecule. When the levels of light-sensitive molecules are low due to vitamin A deficiency, there might not be enough light at night to permit vision. During daylight, there is enough light stimulation to produce vision despite low levels of retinal.

minutes of darkness, when your eyes are about 100 times more sensitive to light. The rods adjust after about 30 minutes, when your eyes are 100,000 times more sensitive to light. This process is reversed when you enter a lighted area—at first your eyes are dazzled by the light, but they adjust after a few seconds.

You must protect your vision at all times, but especially while conducting night operations because it takes such a long time for your eyes to adjust to the dark. After-images caused by an unusually bright light in the dark can cause you to misjudge or incorrectly identify objects in your path. These type mistakes can be detrimental to the mission, or even fatal.

A technique called off-center viewing can help prevent after-images and even sharpen your vision during night operations. In the daytime, you see best if you look at an object directly. However, you see better at night if you look at an object's edge. Practice scanning at night to heighten your off-center viewing skills.

It's important to remember that overall physical health is directly linked to your eyesight. Fatigue, colds, vitamin deficiency, alcohol, stimulants, smoking, or medication can seriously degrade your vision. Keep these factors in mind and take any other precautions to protect your vision. The following tips also can improve the effectiveness of your night vision:

- Adapt your eyes to darkness before an operation and keep them adapted. After exposure to bright light, it takes about 30 minutes for your eyes to adjust to their maximum efficiency.
- Close one eye when exposed to bright light to help avoid the blinding effect.
- Don't wear sunglasses after sunset.
- Move your eyes more slowly in the dark than in daylight.
- Blink your eyes if they become blurred.
- Concentrate on viewing objects.
- Force your eyes to view off center.
- Check out chapter 4 of Field Manual 21-75, *Combat Skills of the Soldier*, which outlines procedures that can help in night observation.

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HALFWAY THERE IN FY05

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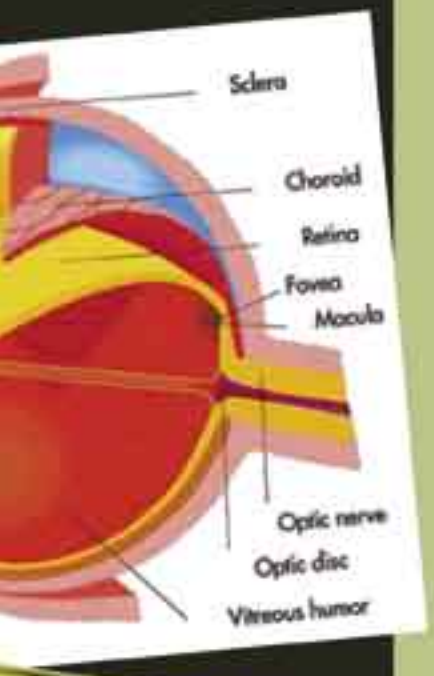

The Army experienced 166 Class A through C Army Motor Vehicle (AMV) and Army Combat Vehicle (ACV) accidents during the first half of Fiscal Year 2005. These 166 accidents killed 39 Soldiers and cost the Army more than $14.5 million. Of that total, AMVs accounted for 84 percent (139) of the accidents and 74 percent (29) of the fatalities. ACVs accounted for 16 percent (27) of the accidents and 26 percent (10) of the fatalities.

AMVs

The vast majority of AMV accidents—71 percent (98)—occurred in HMMWVs, HEMTTs, or LMTVs. Accidents involving HEMTTs accounted for 12 percent (16) of accidents and about 14 percent (4) of fatalities. Also reported were two M915 tractor-truck accidents, with one fatality; one destroyed firefighting truck; one fatality in a cargo truck accident; one LMTV M1078 accident, with one fatality; and one fatality in a 5-ton GOV truck.

Well over half these accidents, or 69 total, happened in HMMWVs and accounted for 72 percent (21) of all AMV fatalities. Up-armored M1114s were involved in about 45 percent (31) of the HMMWV accidents. M998s and M1025s accounted for 38 percent, or 19 percent each, of AMV accidents, with 13 per model. Nearly half of all HMMWV accidents were attributed to rollovers (44 percent, or 30 total), and the 17 Soldiers killed in these accidents made up 81 percent of all AMV fatalities. Alarmingly, rollovers accounted for 30 percent (49) of all reported AMV accidents.

There were 12 reported Class A AMV accidents with 13 fatalities during the first quarter of FY05. This number increased to 15 Class A AMV accidents with 16 fatalities during the second quarter. More than 82 percent of these accidents occurred OCONUS (21 in Iraq and 2 in Kuwait). Four accidents, or 14 percent, occurred in the United States. Just one accident, accounting for less than 1 percent of the total, happened in Afghanistan. Reportedly, 54 percent (15) of the AMV accidents occurred during the day and 46 percent (13) at night.

Army Combat Vehicles

Accidents involving Strykers, M1-series tanks, and Bradley Fighting Vehicles accounted for 70 percent (20) of the ACV Class A through C accidents and 90 percent (9) of fatalities. About 74 percent (20) of the ACV accidents and all 9 fatalities occurred in Iraq. Most of these accidents involved collisions with multiple factors. The top three reported factors were collision with objects other than pedestrians; moving forward and colliding with another moving vehicle; and rollovers. The vast majority of these accidents—78 percent (21)—happened during the day, while 22 percent (6) occurred at night.

There were 15 reported ACV Class A through C accidents with 2 fatalities during the first quarter of FY05. During the second quarter, 12 ACV Class A through C accidents with 8 fatalities were reported. As of mid-July 2005, 12 more ACV Class A through C accidents with 5 fatalities had been reported to the Combat Readiness Center.

Information collected from accident reports is essential to predictive analysis and "connecting the dots" on all losses. Reporting accidents and incidents in a timely manner and maintaining good records is vital to this process. This knowledge can save lives in the future!

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Lost

ACV

Class A (Damage)

- An M1A1 tank was destroyed by fire. The tank experienced unspecified mechanical problems, and the crew aborted the engine after they smelled diesel fuel. The tank then began to smoke heavily and caught fire. No injuries were reported. The accident occurred during the mid-afternoon.

Class B (Damage)

- A BFV suffered Class B damage when a smoke grenade exploded and ignited the vehicle's ammunition. The crew had stowed some equipment in the vehicle during pre-mission inspections. No injuries were reported. The accident occurred during the early morning.

- A BFV suffered Class B damage when it caught fire en route to a warehouse. The crew immediately stopped the vehicle, closed all the hatches, and deployed the fire suppression system. However, the fire continued to burn. No injuries were reported. The accident occurred during the mid-afternoon.

AMV

Class A

- Soldier drowned when the HMMWV he was riding in rolled over into a water-filled ditch. The Soldier was serving as the vehicle's gunner. The Soldiers were on patrol when the road beneath them gave way, causing the HMMWV to overturn into the ditch. The accident occurred during the early afternoon.

- Three Soldiers were injured when their up-armored HMMWV collided with a civilian vehicle during a black-out drive patrol. The driver of the civilian vehicle was killed. The accident occurred during the early evening.

- Soldier suffered fatal injuries when the HEMMT she was riding in struck a barrier and overturned. The driver reportedly lost control of the vehicle before hitting the barrier. The deceased Soldier was serving as the truck commander. The accident occurred during the late evening.

- Soldier was killed when the HMMWV he was driving rolled over. Three other Soldiers suffered minor injuries. The HMMWV was part of a convoy traveling from their field training site back to garrison. The accident occurred during the early evening.

Class B (Damage)

■ An M106 mortar carrier suffered Class B damage when its engine caught fire. The carrier was on its way to a range at the time of the accident. The crew employed the vehicle's fire extinguisher system and also used hand extinguishers to put out the fire. The accident occurred during the mid-morning.

Personnel Injury

Class A

■ Two Soldiers suffered fatal burns while performing guard duty in an observation tower. The Soldiers were wearing ghillie suits at the time of the accident. The source of the fire was undetermined as of press time. The accident occurred during the late evening.

■ Soldier collapsed and died following the 2-mile run portion of the APFT. The Soldier said he felt lightheaded just before he collapsed and stopped breathing. He was pronounced dead at the local hospital. The accident occurred during the mid-morning.

■ Soldier suffered a permanent total disability when he failed to eject his equipment during a free-fall jump and impacted the ground. The Soldier suffered injuries that reportedly will render him quadriplegic. The accident occurred during the mid-afternoon.

Class B

■ Soldier's left-hand fingers were amputated when the grenade he was demonstrating detonated immediately upon activation. The accident occurred during the mid-morning.

■ Parts of a Soldier's hand and fingers were amputated when his hand was crushed between the leg and underside of a flatbed trailer. The Soldier was lowering the support leg of the trailer at the time of the accident. The accident occurred during the early morning.

■ Soldier's finger was amputated when he jumped from an LMTV and caught his hand on the vehicle. The Soldier was preparing the vehicle for add-on armor. The accident occurred during the late afternoon.

Class C

■ Soldier was injured when he was struck by 9 mm simulation ammunition just above his right eye during a MOUT training exercise. The Soldier had removed his safety goggles to clear fog from them during a lull in the fighting. The accident occurred during the mid-morning.

■ Soldier injured his knee while conducting PMCS on an M1070 HET. The Soldier, who'd recently had surgery on his knee, lost his balance and fell off the back of the HET. He was treated and released from the troop medical center.

Other

Class B (Damage)

■ Fire destroyed 31 pallets of Class VIII materials and damaged a supply building. The fire was caused by a generator that overheated. Estimated cost of damage was $550,000. The accident occurred during the late evening.

■ An H-6 explosive detonated while descending into the kettle on the downcomer. The downcomer was destroyed, 12 to 15 acres of land were burned, and hazardous materials left in the surrounding area required cleanup. Estimated cost of damage was $247,000. The accident occurred during the late morning.

WHAT was he THINKING?

Soldier suffered second- and third-degree burns to his hands when his Kevlar helmet caught fire. The Soldier was lighting a cigarette and bent over to shield his lighter from the wind when a strip of burlap from the helmet blew into the flame and caught fire. The Soldier was burned when he removed his helmet. The accident occurred during the mid-afternoon.

VIEW FINDER

SCANNING

The view through NVDs can be a lot like looking down a tunnel. Your normal field of view is almost 190 degrees—but that's cut down to 40 degrees with NVDs. That side—or "peripheral"—vision you're accustomed to, and from which you often see dangers, just isn't there. To adjust, you must constantly turn your head to scan for the dangers on either side of you that you can't see in your narrow field of view.

- Formal scan or search patterns aren't necessary. After relatively little training, search performance is better with "free" viewing.

- Users should adjust their vehicle's speed to fit their location. Typically, NVG users tend to scan more slowly the faster they are traveling because it takes longer to identify fine details. Because of that, vehicle speed should be reduced when driving in congested areas and when traversing rough terrain.

- The first priority when scanning should be to identify hazards. Drivers should identify objects as far away as possible and monitor them until the vehicle is clear. HOWEVER, it's important for drivers not to fixate on an object.

- To avoid becoming fixated, NVG users should not look at any object for more than a second or two.

- The best resolution is in the center of the NVG tube, so off-center viewing should not be used.

- NVG users should not turn their heads too quickly while scanning. Sudden movement can lead to disorientation.

- Scanning tends to slow down or even stop during emergency, unfamiliar, or stressful situations and also when the person is tired.

- All NVD users in a vehicle need to help the driver identify any hazards – especially those on the right shoulder of the road.

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